

## Computer Vision Syndrome among Call Center Employees at Telecommunication Company in Bandung

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### Abstract

**Background:** The occurrence of Computer Vision Syndrome (CVS) at the workplace has increased within decades due to the prolonged use of computers. Knowledge of CVS is necessary in order to develop an awareness of how to prevent and alleviate its prevalence. The objective of this study was to assess the knowledge of CVS among call center employees and to explore the most frequent CVS symptom experienced by the workers.

**Methods:** A descriptive cross sectional study was conducted during the period of September to November 2014 at Telecommunication Company in Bandung using a questionnaire consisting of 30 questions. Out of the 30 questions/statements, 15 statements were about knowledge of CVS and other 15 questions were about the occurrence of CVS and its symptoms. In this study 125 call center employees participated as respondents using consecutive sampling. The level of knowledge was divided into 3 categories: good (76–100%), fair (75–56%) and poor (<56%). The collected data was presented in frequency tabulation.

**Results:** There was 74.4% of the respondents had poor knowledge of CVS. The most symptom experienced by the respondents was asthenopia.

**Conclusions:** The CVS occurs in call center employees with various symptoms and signs. This situation is not supported by good knowledge of the syndrome which can hamper prevention programs. [AMJ.2016;3(2):181–5]

**Keywords:** Call center employees, Computer Vision Syndrome, knowledge

### Introduction

A prolonged computer use may cause vision problems and eye discomfort, namely Computer Vision Syndrome (CVS).<sup>1,2</sup> The level of discomfort seems to increase with the amount of computer use.<sup>1</sup>

The American Optometric Association (AOA) describes CVS as a group of eye and vision-related problems that result from prolonged computer use.<sup>1</sup> Blehm et al.<sup>3</sup> classified CVS symptoms into four main categories; asthenopia, ocular surface, visual, and extra ocular symptoms. Most of the symptoms are temporary and will disappear after the computer user stops working with the computer, yet the symptoms remain in some individuals.<sup>4</sup>

Moreover, CVS occurs in 70–75% of computer users.<sup>4</sup> Even though this syndrome is not life threatening and no research has

proven nor confirmed that CVS might cause permanent eye damage or harm an individual's life, the occurrence of this syndrome may disturb work productivity.<sup>5</sup> The call center employee has a high risk on experiencing CVS due to excessive work demands and prolonged exposure to the computer screen.<sup>6</sup>

Hence, sufficient knowledge about CVS especially about its prevention is essential in order to enhance the individual's awareness about the proper timing in using computers and most importantly about visual ergonomic so that it can minimize or prevent the occurrence of CVS.<sup>7</sup> The objective of this study was to assess the knowledge of CVS among call center employees and to explore the most frequent symptom experienced by them.

### Methods

A descriptive cross sectional approach was

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**Table 1 Demographic Profile of Respondents**

	Frequency (n=125)	Percentage (%)
Gender		
Male	61	48.8
Female	64	51.2
Age (year)		
<25	82	65.6
25–40	41	32.8
>40	2	1.6
Level of Education		
High School	92	73.6
Diploma	17	13.6
Bachelor	16	12.8

used in this study. This study was conducted at the Telecommunication Company in Bandung during the period of September to November 2014 with call center employees as the respondents. Based on the minimal sample size calculation, 125 respondents were included in this study using the consecutive sampling technique. Respondents who had filled the questionnaire incompletely were excluded.

The validated and translated questionnaire consisting of 30 questions was used in this study.<sup>7,8</sup> Out of the 30 questions/statements, 15 statements were about knowledge of CVS and other 15 questions were about the occurrence of CVS and its symptoms. The level of knowledge was divided into 3 categories, i.e. good (76–100%), fair (75–56%) and poor (<56%).<sup>9</sup> The collected data was presented in frequency tabulation.

## Results

The demographic data of respondents was assessed by sex, age, and educational level (Table 1). The table shows that the percentage of female call center employees was similar to the percentage of male call center employees. Most of the respondents were aged less than 25 years and from high school level.

Knowledge of CVS was classified into three categories which are good, fair, and poor (Table 2). The Table shows that most of the respondents had poor knowledge of CVS and none of them had good knowledge.

Knowledge of CVS was assessed by the aspects of definition, etiology, risk factor, sign and symptom, prevention, complication, and visual ergonomics (Table 3). The table shows that 97.6% respondents knew about the definition of CVS but only 16% knew about the complication of CVS.

The symptom of CVS perceived by respondents were divided into four main symptoms; asthenopia, ocular surface, visual, and extraocular symptoms<sup>3</sup> (Table 4). Based on Table 4, 77.8% respondent experienced eye fatigue and the least symptom experienced by the respondent was hard to focus counts.

## Discussion

The knowledge of CVS among call center employees was poor. A study conducted by Akinbinu et al.<sup>7</sup> in Nigeria showed a similar result. The percentage of respondents who had sufficient knowledge was only 27%, and only 40% of them had awareness of the occurrence of CVS. In contrast to a study conducted by

**Table 2 Level of CVS Knowledge**

Score	Frequency (n=125)	Percentage (%)
Good (76–100%)	0	0
Fair (75–56%)	32	25.6
Poor (<56%)	93	74.4

**Table 3 Assessment of CVS based on Components of CVS Knowledge**

CVS Theory	Respondents' answer			
	Correct		Incorrect	
	n	%	n	%
Definition	122	97.6	3	2.4
Etiology	31	24.8	94	75.2
Risk Factor	37	29.6	88	70.4
Sign and Symptom	31	24.8	94	75.2
Prevention	21	16.8	104	83.2
Complication	20	16	105	84
Visual Ergonomics	37	29.6	88	70.4

Zainuddin and Isa<sup>10</sup> in Malaysia, there were only 35.6% of respondents who had poor knowledge about CVS.

Almost all respondents knew the definition of CVS but only a few were aware of the etiology, causes, risk factors, symptoms, prevention, complications, and visual ergonomics. According to a research conducted by Mujaddidi<sup>11</sup> in Semarang showed that none of the respondents were aware of the risk factors of the CVS incidence. A research conducted

by Chiemeke et al.<sup>12</sup> in Nigeria showed that only 32% of respondents knew about the prevention of CVS.

Furthermore, another research on visual ergonomics conducted by Zainuddin and Isa<sup>10</sup> in Malaysia showed that the respondents had less knowledge about visual ergonomics. A similar study conducted by Khan et al.<sup>13</sup> in Pakistan showed that only 30% were aware of the visual ergonomics at the workplace. A previous study conducted by Logaraj et al.<sup>14</sup> in

**Table 4 Symptoms of CVS**

Symptoms	Frequency (n=107)	Percentage (%)
Asthenopia		
Eye Fatigue	97	77.6
Eye Strain	24	19.2
Eye Pain	38	30.4
Dry Eye	42	33.6
Headache	57	45.6
Ocular Surface		
Watery eye	60	48
Irritation	52	41.6
Visual		
Blurred Vision	48	38.4
Doubled Vision	32	25.6
Hard to Focus	2	1.6
Extra ocular		
Neck pain	51	40.8
Shoulder pain	54	43.2
Back pain	59	47.2

Chennai found that only 58.7% of respondents applied appropriate visual ergonomics, in the form of an ideal distance eye with monitor.

A poor knowledge of CVS among respondents in this company might be caused by two factors. Firstly, the terminology of CVS was unfamiliar in the community, meanwhile AOA stated that approximately 70–75% of computer users experienced CVS symptoms. Secondly, there has never been a socialization program about CVS among them. In fact, a call center occupation is one of the jobs that is frequently exposed to a monitor that has a high risk to experience CVS.<sup>6</sup> Good knowledge of CVS especially about its prevention may help to reduce the number of incidence of CVS in a population.<sup>7</sup>

The most complaint perceived by the respondents was asthenopia. This result is consistent with a similar study conducted by Bali et al.<sup>15</sup> in India, Franz and Erizone<sup>16</sup> in Jakarta and Reddy et al.<sup>17</sup> in Malaysia.

The vision problem which occurred when an individual works in front of a computer is caused by the combination of the vision problems owned by the individual and poor ergonomics. Those might cause uncomfortable working environment and an unfavorable attitude while working in front of the computer.<sup>18</sup>

Moreover, a previous research conducted by Zakiuddin and Isa<sup>10</sup> in Malaysia showed that 50% of respondents indicated a bad habit in using a computer at the workplace. A similar study conducted by Mvungi et al.<sup>19</sup> in Africa showed that the occurrence of CVS was mainly caused by poor knowledge about the proper attitude when working with the computer.

The occurrence of CVS among respondents was high however, the knowledge about it is still poor, the respondents were unaware that they suffered from CVS and they also, did not know about its prevention. If CVS is left untreated it might cause an individual to experience obstacles in their daily activities, decrease work productivity, increase in the level of error in their work, as well as a decrease in job satisfaction.<sup>4</sup>

This study had limitations, among others were the sampling method and the number of questions about the knowledge of CVS. The consecutive sampling was performed because firstly, the sample size was too large; secondly, the questionnaire should be filled out under supervision and should not be taken home. Due to different shift work schedules it was quite difficult for the researcher to meet with the night shift respondents.

Based on this study, it can be concluded that the knowledge of CVS among call center employees is still poor. The most sign and symptom experienced by the workers were asthenopia.

For further research, the sampling method should be conducted randomly in order to avoid a biased selection and give equal opportunity to all employees to be included in the study. The company should be more concerned about the occurrence of CVS among the workers because it can affect the quality and productivity of the workers in the workplace. Good knowledge about CVS is necessary to conduct early prevention.

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